

**MACTECH HEAVY DUTY
PORTABLE MILLS**

**OPERATING MANUAL
& PARTS LIST**

SERIAL NO. _____

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SAFETY INSTRUCTIONS

- Wear protective clothing, including safety glasses and steel toe boots.
- **DO NOT** allow loose clothing or long hair near machine operations.
- Keep work site and machine clean. Use brush to remove chips. **DO NOT** use hands or air hose.
- Ensure adequate clearance around pipe before mounting milling machine.
- Support machining surface for total machine weight.
- **DO NOT** rush the job. Read this manual and understand the operating procedure before attempting any cutting operation. Call our toll free number (1-800-328-1488) if any problems arise.
- Before connecting the hoses to the machine, be sure the following components are tightly secured: slide, tool bits, motor mount, and vertical feed support angle bracket.
- Be sure the mill is completely secured to the work surface *before* starting the machine.
- During actual machine operation, **DO NOT** touch or rest your hand on or near any moving parts or sharp edges.
- Disconnect air hose or hydraulic power source **BEFORE** dismounting lathe from pipe.
- **NEVER MOVE MACHINE WHILE CONNECTED TO AIR OR HYDRAULIC SUPPLY. ALWAYS** turn off control valve and disconnect hoses **BEFORE** attempting to move the machine.

INTRODUCTION

General Description

Mactech Heavy Duty Portable Mills are designed to make on-site, close tolerance machining cost effective. Our mills can be clamped, bolted, or magnetically attached directly onto the workpiece and mounted in any direction. Infinitely variable power feed is available on the vertical feed slide assembly.

MACHINE SPECIFICATIONS

Capabilities & Functions

Capabilities

- Drilling
- Chamfering
- Boring
- Tapping

Functions

Mactech Heavy Duty Portable Mill are used to perform gamma plug installation, stud removal, thermoweld installation, and numerous other milling jobs.

The milling machine can machine steel and various alloys, stainless steel, aluminum, copper-nickel, nickel-copper-iron, and bronze.

Tooling

High speed tool steel bits, drill bits and milling bits or different sizes are available for most machining operations. Mactech stocks many standard tool bit configurations.

Frame Components

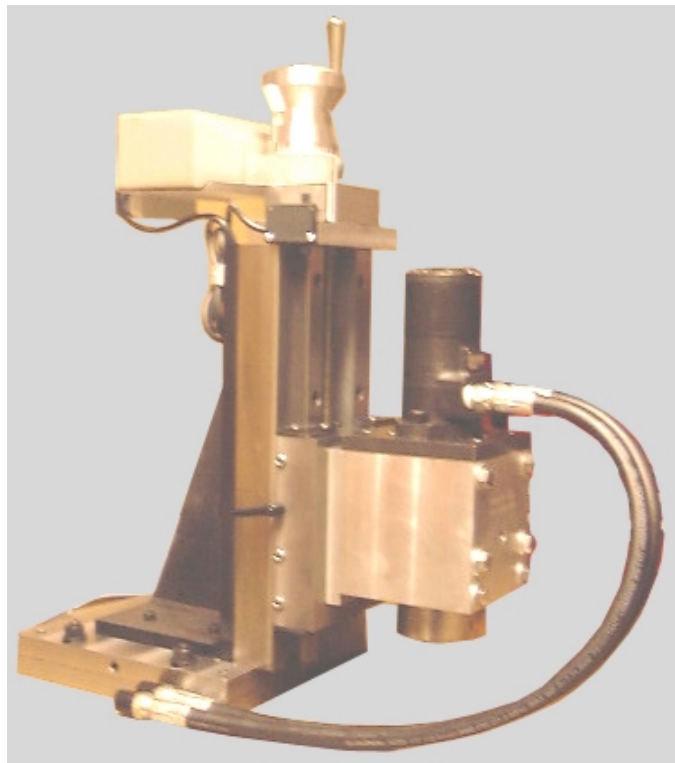
The milling head assembly feeds vertically along the cast iron feed support angle bracket into the work piece. The bracket is attached to the steel base plates, which can be positioned for precise alignment. Both the extra and super duty models include additional bracket supports.

Vertical Slide

The slide is made of cast iron, comprised of ways and saddles with adjustable gibs, and a full length feed screw.

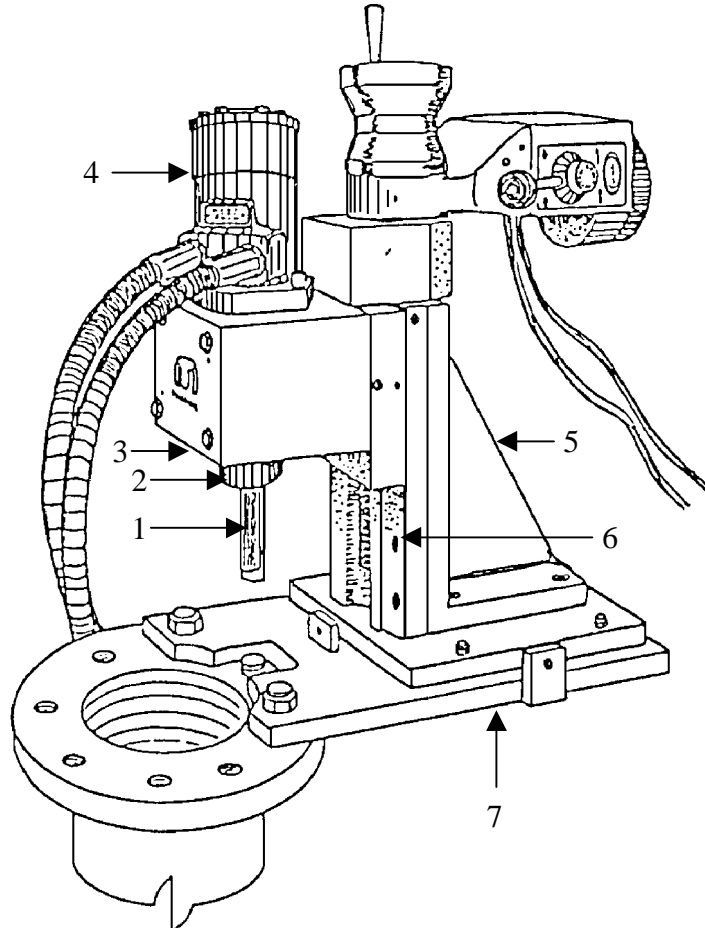
Drive Assembly

- In-Line Air Drive (97 RPM max), also includes air caddy.
- Hydraulic drive (137 RPM max).



Mactech Heavy Duty Portable Mill

View of Heavy Duty Portable Mill powered by hydraulic drive. Hand crank provides vertical feed.



<u>Reference No.</u>	<u>Part Description</u>
No. 1	Tool Bit
No. 2	Quill
No. 3	Motor Mount
No. 4	Hydraulic Motor
No. 5	Vertical Slide Support & Bracket
No. 6	Vertical Slide Support & Saddle
No. 7	Steel Base Plates

<u>Model:</u>	<u>Weight</u>	<u>Travel</u>
HD Mill	220 lbs	Vertical Travel 6"
EHD Mill	262 lbs	Vertical Travel 12"
SHD Mill	306 lbs	Vertical Travel 18"
Air/Hydraulic Drive	25 lbs	
Servo Drive	25 lbs	

MACHINE SET-UP

Read **SAFETY INSTRUCTIONS** on Page 1.

Assembly Procedure

Clear worksite of all obstructions and clean area.

Assemble aluminum base components (if needed) and install on working surface (see below).

Installation on Curved Surface (In-Line Pipe):

1. Attach aluminum saddle to steel base by wrapping chains around pipe.
Note: Have partner hold base while connecting chains around pipe.
2. Square and level base to pipe surface (if necessary).
3. Attach cast iron vertical support bracket and slide to the steel base.
4. Square and level base (if necessary).

Installation on Flat Surface:

1. Attach vertical support bracket to steel base and/or flat surface (bolt, tack weld, clamp, or magnetically attach).
2. Square and level base.

Installing Motor

CAUTION! Control Valve must be turned *OFF* before installation of motor.

1. Insert motor so that keyed shaft aligns with the quill keyway. Tighten motor mount screws.
2. With control valve off, connect hoses to power supply/air supply. Test run motor to check speed.

HYDRAULIC POWER SUPPLY SET-UP

**** NOTE:** See “Mactech Hydraulic Power Supply Handbook” for further information.

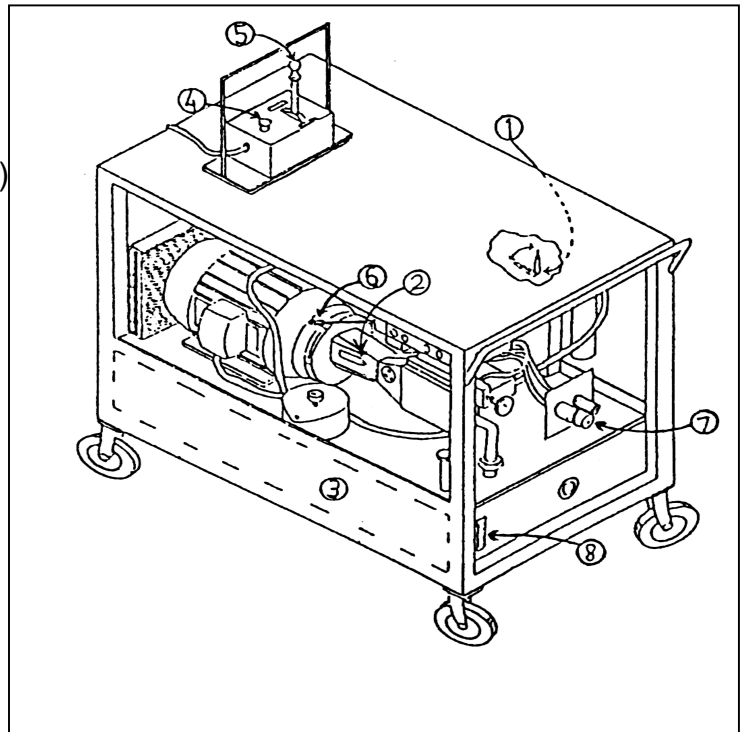
1. Select 230 or 460 outlet. See inside electric control box for directions on how to change voltage connections.

**** CAUTION:** All electrical work must be performed by a qualified electrician.

2. Connect hoses to couplings (#7).
3. With pendant knob (#4) off and control lever (#5) neutral, turn off main switch.
4. While viewing direction indicator (#2), turn on pendant knob. Shaft should spin in the direction of the arrow. If not, turn off pendant knob and main switch, change wiring rotation, and re-attempt step #3. When spinning properly, the power supply is ready to use.

SPECIFIED COMPONENTS

1. Main Switch (Control Box)
2. Motor Direction Indicator
3. Hydraulic Fluid Reservoir
4. Pendant On/Off Knob
5. Pendant Control Lever
6. Pressure Release Lever
7. Couplings, Female/Male
8. Fluid Sight Glass



Hydraulic Power Supply & Remote Control

MACHINE OPERATION

Read **SAFETY INSTRUCTIONS** on Page 1.

Note: The hand crank should offer some resistance while turning. If it is too loose or tight, the jam nuts may be slightly adjusted. Do not allow “slop” in the slides.

Drilling and Sawing Holes

1. Follow Set-Up procedures. Attach air or hydraulic supply to the motor while control valve is OFF. Insert drill chuck into quill and secure. Insert center drill bit, regular drill bit, spade bit or hole saw into chuck and secure. Open control valve slowly to check function and speed.
2. Use control valve to control cutting speed. To avoid chatter, do not allow saddles to extend beyond supporting slides. If chatter vibration occurs, reduce speed. If tool bit(s) chip or become dull, replace them. Use coolant when possible.

CAUTION! The cutting operation is continuous until terminated by the operator. To stop machine during cutting, back bit away from material, then close control valve. This will reduce tool pressure and potential gouging.

3. Close control valve to stop motor. Disconnect hoses. Back tool to FULL OUT POSITION.

Boring Holes

Follow above procedures, with following exception: Replace drill chuck with boring bar and bit. If desired, use dial indicator for precise hole alignment.

Chamfering Holes

Follow above procedures, with following exception: Replace drill chuck with boring bar and angled chamfering tool. If desired use dial indicator for precise hole alignment. Step cut to desired depth and chamfer.

Tapping Holes

Follow above procedure, with following exception:
Replace drill bit with tapping bit. Use dial indicator for precise hole alignment.

Facing Flat Surfaces (longitudinal and cross slides required)

1. Follow drilling set-up procedures, but replace drill chuck with facing mill or fly cutter and bit. Open control valve slowly to check function and speed.
2. Turn crank on vertical slide to bring bit down to surface. To avoid chatter, do not allow saddles to extend beyond supporting slides.
3. Use control valve to control cutting speed. If chatter or vibration occurs, reduce speed. If tool bit(s) chip or become dull, replace them. Use coolant when possible.

CAUTION! The cutting operation is continuous until terminated by the operator. To stop machining process during cutting, back bit away from material, then close control valve. This will reduce tool pressure and potential gouging.

4. Close control valve to stop motor. Disconnect hoses. Back tool to FULL OUT POSITION.

Milling Flat Surfaces (longitudinal and cross slides required)

Follow above procedures, with following exception:
Replace cutter with tool shank holder and end mill or another appropriate tool.

Operation Completion

Close control valve. Disconnect air or hydraulic supply. To remove portable mill follow set-up directions in reverse.

Machine Maintenance

Prevent corrosion by cleaning machine exterior with a solvent, then apply rust inhibitors and store in a dry area. Grease internal gears regularly, depending on use.

NOTE: Mactech recommends sending the machine to our service facility after every 250 machining hours for inspection and tune-up (nominal fee applies).

• RECORD OF MACHINING					
<u>Date</u>	<u>Hours</u>	<u>Date</u>	<u>Hours</u>	<u>Date</u>	<u>Hours</u>
TOTAL		TOTAL		TOTAL	

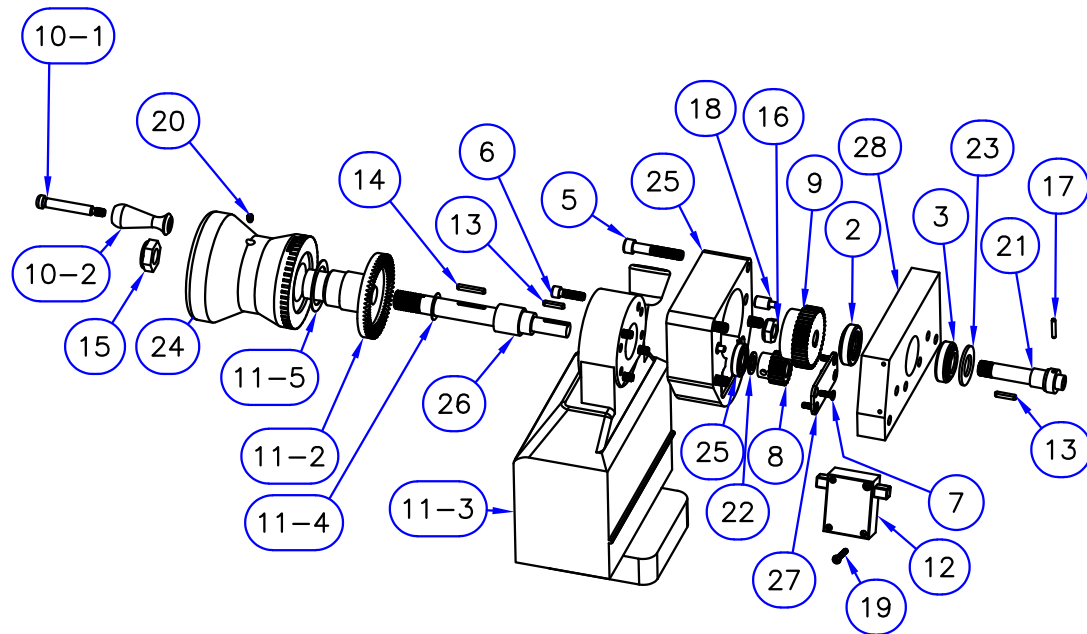
Parts Information

Use the attached parts diagrams to order replacement parts. When ordering parts please include the following information: type of machine, serial number, contact person, phone/fax number, shipping address, date of purchase, and payment information.

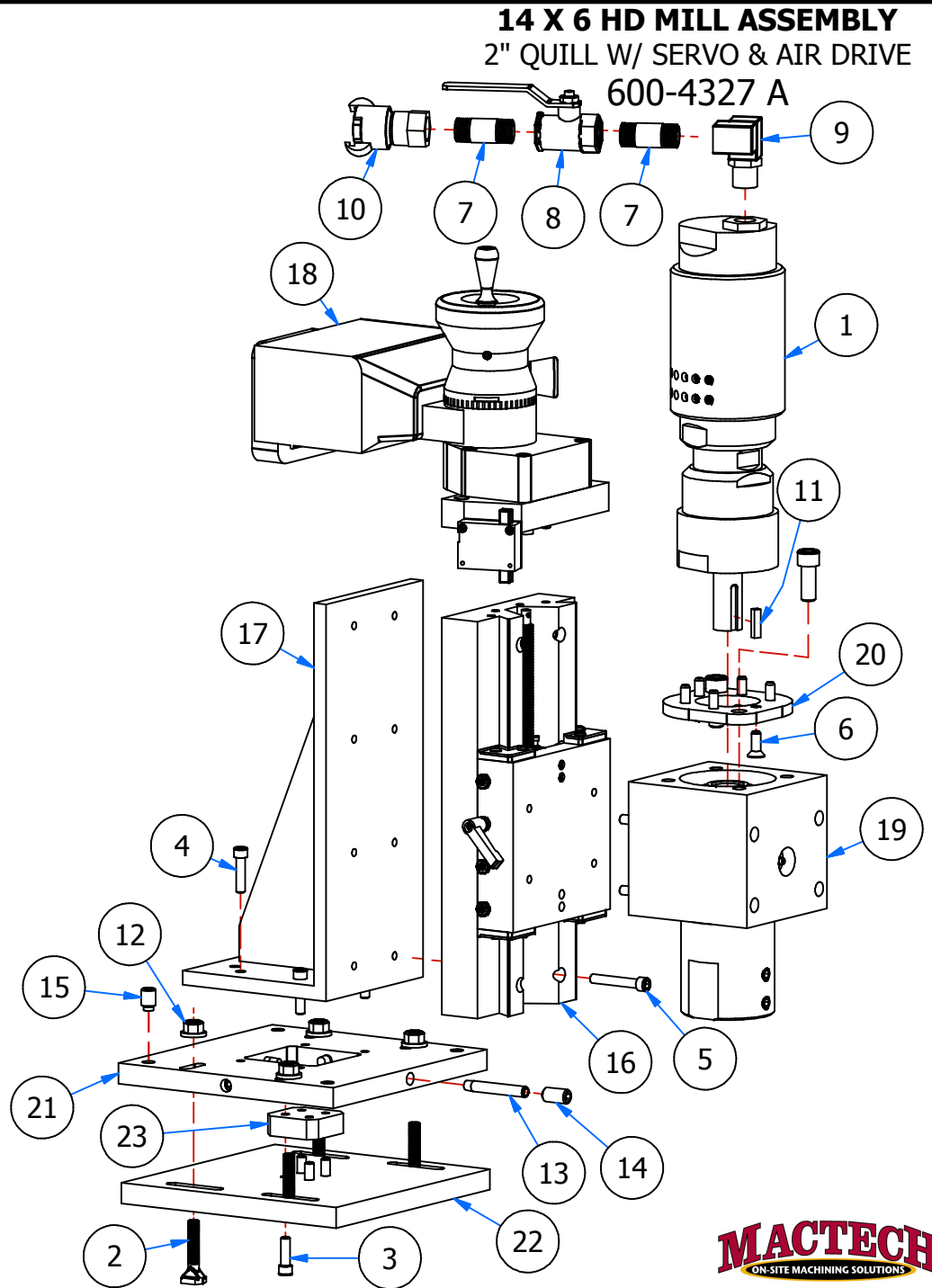
2:1 SERVO FEED ASSEMBLY - ND6

600-2844

ITEM	PART NO.	QTY	DESCRIPTION
1	020-0089	1	RADIAL BALL BEARING 1/2 X 1-1/4 X .25 WIDE
2	020-0131	1	TAPERED BEARING, .5 X 1.378
3	020-0137	1	TAPERED BEARING, .625 X 1.378
5	070-0062	4	5/16-18 X 1-3/4 SOCKET HEAD CAP SCREW
6	070-0072	4	1/4-20 X 7/8 SHCS
7	071-0031	4	8-32 X 1/2 FHCS
8	100-0103	1	SPUR GEAR - 20 DP, 20 PA, 1" PD W/KEYWAY
9	100-0237	1	SPUR GEAR 2" PD, 20 DP W/KEYWAY
10	120-0038	1	REVOLVING HANDLE - 2" LONG
10-1	061-0027	1	5/16 X 1.75 SHOULDER SCREW
10-2	HANDLE	1	2" HANDLE
11	130-0210	1	WORKHORSE SERVO MOTOR
11-1	130-0210 A0100-01	1	BEVEL GEAR NUT
11-2	130-0210 P01025	1	BEVEL GEAR
11-3	130-0210 A0100	1	SERVO TOP HOUSING BODY
11-4	130-0210 A0100-02_	1	34MM SPACING WASHER
11-5	130-0210 A0100-04_	1	16MM SPACING WASHER
12	130-0210 LIMIT SWITCH	1	LIMIT SWITCH
13	150-0034	2	1/8 SQ X 7/8 KEY, ROUNDED ENDS
14	150-0054	1	1/8 X 1 KEY, ROUNDED ENDS
15	170-0030	1	5/8-11 JAM STYLE ELASTIC LOCKNUT
16	170-0057	1	1/2-20 JAM STYLE ELASTIC LOCKNUT
17	200-0076	1	SPRING PIN 1/8 X 3/4
18	200-0084	2	3/16 TO 3/8 LOCATING DOWEL
19	300-0105	2	6-32 X 1 PAN HEAD PHILLIPS MACHINE SCREW
20	340-0053	1	10-24 X 1/4 NYLON TIPPED SET SCREW
21	387-0125	1	ND6 FEEDSCREW SHAFT END
22	480-1050	1	STEEL SHIM WASHER 1/2 X .062 THK
23	480-1051	1	3/4 X 1.365 X .088 SPACING WASHER
24	620-1349	1	SERVO HANDLE BODY
25	620-4054	1	SERVO GEARBOX - WORKHORSE
26	620-4055	1	SERVO ADAPTOR SHAFT - WORKHORSE
27	620-4057	1	SERVO GEARBOX COVER PLATE
28	620-4059	1	SERVO MTG PLATE - GILMAN ND6 & DC6
4	070-0006	4	5/16-18 X 1" SHCS

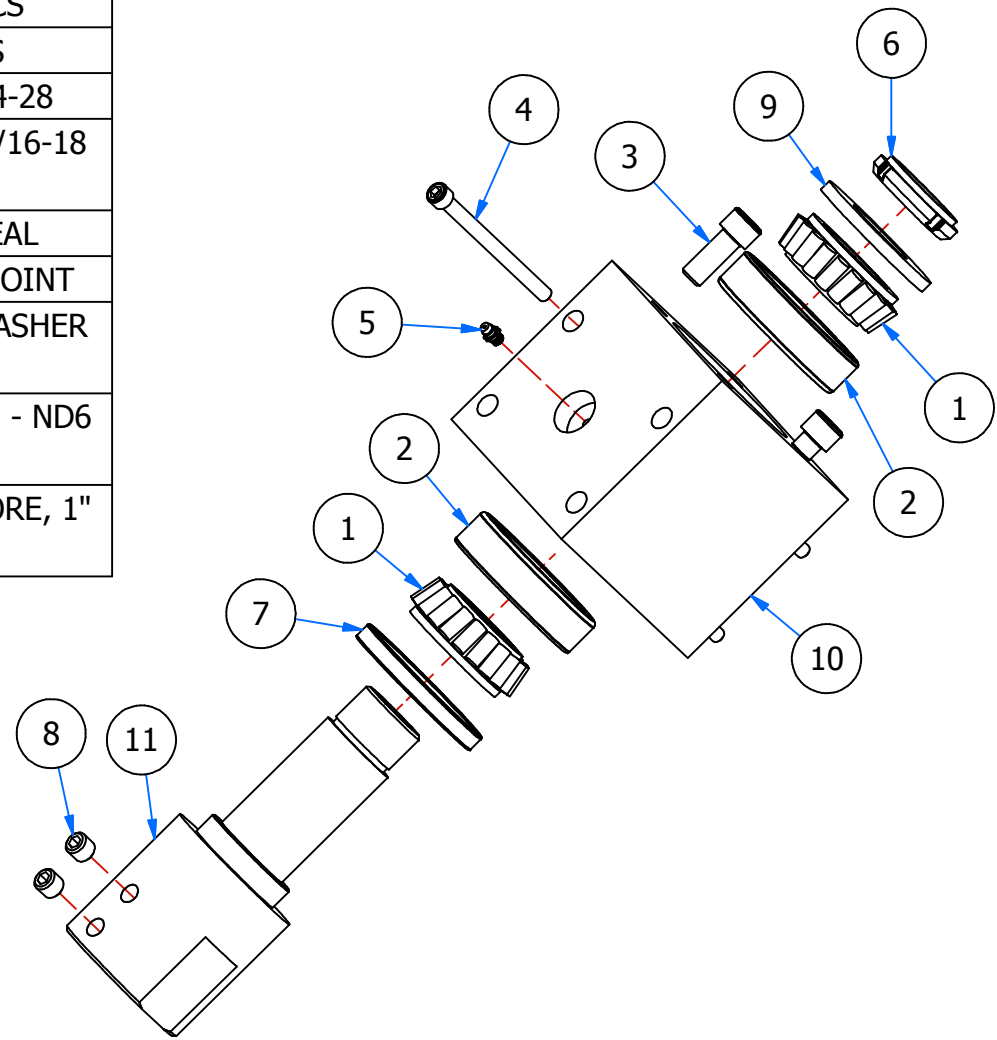


ITEM	PART NUMBER	QTY	DESCRIPTION
1	010-1025	1	ATLAS COPCO LZB77-17 AIR MOTOR
2	030-0007	4	3/8-16 X 2 T-SLOT BOLT
3	070-0006	4	5/16 - 18 x 1 SHCS
4	070-0007	4	5/16 - 18 x 1 1/4 SHCS
5	070-0040	8	5/16 - 18 x 2 SHCS
6	071-0038	6	5/16-18 x 7/8 FHCS
7	127-0001	2	PIPE NIPPLE
8	127-0002	1	1/2" BALL VALVE - 1/2 NPTF, 1/2 NPTF
9	127-0058	1	1/2" DOUBLE SWIVLE COUPLING
10	128-0024	1	1/2" NPTF EARLOCK COUPLING
11	150-0061	1	1/4 x 1 SQUARE MACHINE KEY
12	170-0025	4	3/8-16 FLANGE NUT
13	200-0077	4	3/8 x 2 1/2 HARDENED GROUND PRODUCTION DOWEL PIN
14	340-0025	4	1/2-13 x 1 SSS-CUP POINT
15	340-0037	4	1/2-13 x 3/4 SSS-BRASS TIP
16	387-0084 MOD-J	1	ND6 SLIDE ASSY W/O FEED SCREW DRIVE ASSY
17	387-0120	1	NDA6 RIGHT ANGLE BRACKET
18	600-2844	1	2:1 SERVO FEED ASSEMBLY WITH ND6/DC6 SLIDE PLATE
19	600-4326	1	ND6 HD QUILL HOUSING ASSY - 2" STRAIGHT QUILL, 1" INPUT
20	620-1054	1	2 BOLT FLANGE ADAPTER
21	620-4150	1	SHIFT PLATE TOP - NDA6
22	620-4151	1	MILL SHIFT PLATE BOTTOM - NDA6
23	620-4152	1	SHIFT PLATE PUSH BLOCK



PARTS LIST			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	025-0008	2	BEARING CONE #25584 - ID 1.771
2	025-0009	2	TAPERED BEARING CUP #25527 - OD 3.3465
3	070-0035	2	1/2 - 13 x 1 1/4 SHCS
4	070-0092	4	5/16 - 18 x 4 SHCS
5	142-0001	1	GREASE FITTING - 1/4-28
6	170-0019	1	BEARHUG LOCKNUT 1-9/16-18
7	320-0011	1	2.255 X 3.350 OIL SEAL
8	340-0017	2	1/2-13 x 1/2 SSS-CUP POINT
9	620-1932	1	BEARING RETAINING WASHER
10	620-3510	1	HD PMM QUILL HOUSING - ND6 SADDLE
11	620-4188	1	HD MILL SPINDLE - 2" BORE, 1" INPUT

ND6 HD QUILL HOUSING ASSEMBLY 2" STRAIGHT QUILL, 1" INPUT 600-4326



PARTS LIST			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	070-0066	2	6 - 32 x 1/2 SHCS
2	070-0101	2	8 - 32 x 1 SHCS
3	072-0001	8	10 - 24 x 1/2 BHCS
4	072-0019	1	1/4 - 20 x 1/2 BHCS
5	170-0047	4	1/4-28 HEX JAM NUT - PLAIN
6	340-0099	3	1/4-28 x 1 1/4 SSS-FULL DOG
7	387-0086	1	ND6 SLIDE
8	387-0087	1	ND6 SLIDE W/MOUNTING HOLES
9	387-0088	1	ND6 GIB
10	387-0090	1	ND6 FEEDNUT SPACER PLATE
11	387-0091	1	ND4/6 FEED NUT 1/2-10 LH ACME
12	387-0093	1	ND4/6 GIB LOCKING SCREW ASSY
13	387-0098	1	ND4/6 FEEDSCREW 1/2-10 LH ACME
14	387-0101	1	ND6 FRONT WIPER - GIB SIDE
15	387-0102	1	ND6 REAR WIPER - GIB SIDE
16	387-0103	1	ND6 FRONT WIPER - NON-GIB SIDE
17	387-0104	1	ND6 REAR WIPER - NON-GIB SIDE
18	387-0105	2	ND6 WAY WIPER RETAINER - GIB SIDE
19	387-0106	2	ND6 WAY WIPER RETAINER - NON-GIB SIDE
20	480-1070 B	1	1/4 USS PLAIN WASHER
21	387-0084	1	ND6 SLIDE ASSEMBLY

ND6 SLIDE ASSEMBLY

W/O FEED SCREW PLATE

387-0084 MOD-J

